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## Operational Efficiency of the Palestinian Agricultural Markets for the Period 2001- 2005

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### Abstract:

Operational efficiency is one way of measuring market efficiency. It is measured in terms of marketing costs and marketing margins. The marketing system is said to be efficient if market margins can be reduced by a level of cost that is less or equal to the level of expenses involved in providing an additional marketing service. The main objective of this study is to test the efficiency indicator of the marketing process by research on marketing margins and costs for the fruits and vegetables in Palestine for the 2001-2005 period. Results showed that farmers are receiving low returns for their products compared to the other parties of the market. High costs are paid by farmers for both the transportation and packaging and these high costs could be reduced if farmers organize these two functions in better ways either by being involved more in cooperatives or in new collectives marketing methods. The losses are major item of the marketing costs for all the market chain and this item could be reduced by improving the facilities and techniques of post harvest to improve the efficiency marketing. Various recommendations are proposed at the end of this research.

### المخلص:

الكفاءة التشغيلية هي إحدى طرق قياس كفاءة السوق، تقاس الكفاءة التشغيلية بدراسة تكاليف التسويق والهوامش التسويقية. يعتبر النظام التسويقي كفواً إذا أمكن تخفيض مستوى الهوامش التسويقية إلى أقل من مستوى التكاليف أو يساوي إضافة خدمات تسويقية جديدة. الهدف الرئيس من هذا البحث هو دراسة كفاءة العملية التسويقية باختبار معياري الهوامش والتكاليف التسويقية لمحاصيل الخضار والفواكه في فلسطين في الفترة الواقعة ما بين 2001-

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2005. بينت النتائج أن المزارعين قد حصلوا على عوائد قليلة لمحاصيلهم مقارنة بالآخرين ممن يعملون في السوق. هناك تكاليف عالية يدفعها المزارعون لوظيفتي المواصلات والتعبئة ويمكن تخفيض هذه التكاليف بتنظيم الوظيفتين بشكل أفضل عن طريق اندماج المزارعين بالتعاونيات أو إيجاد طرق تجميعية تسويقية حديثة. يعتبر التلف والفقدان للمحاصيل من أهم العوامل في رفع التكاليف لجميع القنوات التسويقية المختلفة ويمكن تخفيض هذه التكاليف بتحسين وسائل وتقنيات ما بعد الحصاد. في نهاية البحث تم وضع بعض التوصيات الخاصة لرفع كفاءة النظام التسويقي.

## Introduction:

Operational efficiency for the markets is measured in terms of marketing costs and marketing margins. The marketing system is said to be efficient if market margins can be reduced by a level of cost that is less or equal to the level of expenses involved in providing an additional marketing service and policies to improve the efficiency of agricultural marketing that would have a self - accelerating effect on productivity.

There is a need for new studies which focus on the marketing margins and changes of the factors affecting them as a result of continuously changing factors affecting the marketing systems. The average monthly wholesale and retail prices of selected crops for the two areas West Bank and Gaza have been reviewed from the data published by the Palestinian Bureau of Statistics.

The marketing costs and margins of fruits and vegetables in the West Bank and Gaza were calculated depending on meetings with experts( agricultural engineers, commission agents, leading farmers, etc...) for 2001- 2005, and finally conclusions concerning the operational efficiency of Palestinian agricultural markets have been discussed.

## Theoretical background

Market efficiency is measured in two ways: (a) pricing efficiency and (b) operational efficiency. Pricing efficiency is measured in terms of correlation of price movements of the same product in separate markets. Operational efficiency is measured in terms of marketing costs and marketing margins (Aburajab Tamimi 1999).

Marketing margin is an equilibrium entity that is a function of the difference between equilibrium retail and farm prices (Wohlgenant, 2001), or between export and farm prices (Carambas, 2005). Marketing margins provide neither a measure of farmers' well-being nor of marketing firms' performance. However, they give an indication of the performance of a particular industry (Tomek and Robinson, 1990), or an indication of the market's structure and efficiency. For instance, Gordon and Hazledine (1996) have argued and shown in their study that the form of the market power is likely to manifest in larger marketing margins than would otherwise be the case.

The study by Gardner (1975) provided a basic framework for analyzing marketing margins. It defined the major sources of variation in the retail-farm price spread, i.e., shifts in the retail food demand, in the farm product sup-

ply, or in the supply of marketing services. Similarly, Heien (1977) came up with an analysis of farm-retail margin (in percentage difference) that related margin with farm output and the ratio of retail price and marketing costs. Using the Cobb-Douglas production function, his analysis showed that an increase in the marketing costs and in the level of farm output reduces the percentage of marketing margin.

The marketing system is said to be efficient if market margins can be reduced by a level of cost that is less or equal to the level of expenses involved in providing an additional marketing service (Aburajab Tamimi 1999).

An efficient farm marketing system is an important means for raising the income levels of farmers and for promoting the economic development of a country. The farmers allocate their resources according to their comparative advantage and invest in modern farm inputs to obtain enhanced productivity and production. This, in turn, contributes to increased market surplus of farm products and increased interregional trade, which increases demand for capacity increases in market facilities. Hence, policies to improve the efficiency of agricultural marketing would have a self - accelerating effect on productivity. However, before formulating any such policies, it is necessary to find out the degree to which the existing marketing system can be called "efficient" and also to identify and quantify the impact of relevant factors that determine efficiency of marketing system, so that improvements can be directed towards factors which are crucial in determining

efficiency.

### **Previous study about marketing margins in Palestine**

Aburajab Tamimi (1999) calculated marketing margins for six fruit and vegetable crops. The fruit crops were grapes, plums, and oranges. In addition, the vegetable crops were tomatoes, eggplants, and onions.

Price spreads had been calculated by comparing prices at different levels of marketing at the same point in time (concurrent method).

The average absolute share of the wholesaler is ranging between 0 15 NIS 1 kg for onions to 0.26 NIS 1 kg for plums. The average percentage of wholesaler share to the wholesaler price is 13% for plums, 17% for grapes, 21 % for eggplants and onions, and 22% for tomatoes and oranges.

The average absolute shares of retailers are higher than the average absolute shares of wholesalers; these are ranging between 0.27 NIS 1 kg for onion and 0.79 NIS / kg for plums. The average percentage of the wholesaler share to the retailer price is 9% for plums, 13% for grapes, 15% for onions and eggplants, and 17% for tomatoes and oranges, while it is for the retailer share 23% for grapes, 25% for tomatoes, 27% for plums, 28% for both onions and oranges, and 29% for eggplants.

The average percentage of producer share to consumer or retailer price is 63% for plums and grapes, 58% for tomatoes, 57% for onions, 56% for eggplants, and 55% for oranges (Aburajab Tamimi 1999).

## Study objectives

Like other rapidly developing countries, changes in economic and social conditions are producing pressures for changes in marketing system. Such changes are normal and reasonable. Rapid population and income growth, concentration of the population in the cities, improvements in transportation and communication infrastructure, dramatic improvements in production technology and efficiency along with drowning demands for higher quality produce by consumer as well as foreign markets, are the major factors producing pressure for change in the marketing system. In addition to these factors, Palestine has aspecial situation of changes during the last decade as the formation of Palestinian Authority, and special continuous constraints since 1967.

Because of these changes there is a need for new studies which focus on the marketing margins and changes of the factors affecting them.

Based on these facts there is a need for continuous studies of marketing costs and margins in Palestine.

The main objective of this study is to continue the research on marketing margins of the fruits and vegetables in Palestine for the 2001- 2005 period - as an efficiency indicator of the marketing process- and to check their changes in comparison with the previous studies, which were made in earliest years of the 90s and to keep history for such data that could benefit the future expectations.

Other objectives are:

- To study and analyze the marketing costs of the agricultural products in Palestine,
- Compare between the marketing margins between the wholesalers, the retailers and the different marketing channels in Palestine, and
- To recommend some tools for improving the marketing process in Palestine.

## Methodology and data

For this study, the average monthly wholesale and retail prices of selected crops for the two areas: West Bank and Gaza have been reviewed for the period 2001-2003 from the data published by the Palestinian Bureau of Statistics. After a field study and meetings with farmers, wholesalers, and retailers in summer of 2005 the researcher calculated the marketing costs of fruits and vegetables in the West Bank and Gaza and this made it possible to calculate farm gate prices and producer prices for the selected fruits and vegetables. The final step was to calculate the marketing shares for farmers, wholesales and retailers at different stages of the fruit marketing channels in both the West Bank alone and the Gaza Strip.

The calculation and the methodology that have been used were the same which were used by Aburajab Tamimi (1999).

## Results and discussions

### The average estimates of marketing margins in West Bank for selected fruits and citrus

By reviewing Annex 1 which includes the marketing margins in West Bank for selected fruits and citrus for the period 2001-2005 it was found that banana has the lowest percent share of producer to the wholesale price which is about 79%, while oranges, lemons, grapes and plums have the same percent share value of producer to the wholesale price and it is about 82%.

The percent share of producer to retailer price is also the lowest for banana which is about 43% followed by oranges (49%), while the highest is for both plums and lemons with a value about 52%.

The average absolute share of wholesaler ranges from 0.27 NIS/kg for oranges to 0.54 NIS/kg for plums. Compared to the retailers prices, the absolute shares for the retailers were ranging from 1.00 NIS/kg for lemon to 1.74 NIS/kg for plums. The absolute share for the retailers for banana was 1.57 NIS/kg and it is higher than grapes which is 1.46 NIS/kg.

The percent share of the wholesaler to retailer prices is almost the same for all the crops and it equals 11%.

The average percent of producer shares for the five crops to the retailer prices was 49%; it is 11% for the wholesalers and 40% for the retailers. These averages do not give a good margin for the producers as it is less than 50%. Retailers got high margins especially for

management and operational cost and losses.

### The average estimates of marketing margins in the West Bank for selected vegetables

By reviewing the average estimates of marketing margins in the West Bank for selected vegetables in Annex2, the farm gate price was the highest for cucumber followed by tomatoes, dry onions, potatoes, and finally the egg plants. The eggplant producer price in wholesale market and the wholesaler was in the third place and replaced dry onions and potatoes prices which came fourth and fifth in this studied series.

The retailer price for potato came in the second place after cucumbers, tomatoes and eggplants in the third place and the fourth place, and dry onions in the fifth place.

The percent share of farm gate price to producer prices ranges between 78% - 85% for the five selected vegetables, while the percent share of farm gate prices to wholesaler prices ranges between 64% - 70%.

Looking for the share of farm gate prices to retailer prices we found that its average for the five vegetables crops in West Bank did not exceed 44% and this means that other parties in the market who usually for the most crops do not add any real value for the product receive more than 56% of share of the price.

### **The average estimates of marketing margins in the Gaza Strip for the selected fruits**

The three crops that had been studied in Gaza were oranges, lemons, and grapes (Annex3). Oranges prices were the lowest; they were 0.67 NIS at a farm gate, 1.16NIS wholesale price, and 1.79 NIS as retailer price. Grapes prices are the highest and range between 1.68 NIS (farm gate) – 3.26 NIS(retailer).

The percent share of oranges farm gate to producer price in the wholesale market is 71%, it is 58% to wholesaler price and 37% to retailer price. For lemons these percentages are 79%, 65%, and 45%. And for grapes they are 86%, 70%, and 52%.

Depending on the previous statement we may conclude that citrus farmers are receiving low returns for their products comparing to the other parties of the market. Grapes farmers who are more intensified are receiving better shares.

### **The average estimates of marketing margins in the Gaza Strip for the selected vegetables**

For the studied period which depended mostly on the published data of the Palestinian Bureau of Statistics, most of Gaza vegetables were sold on whole-sale level to be exported. Some of them were registered as they left but actually because of the closure they returned back and sold on the retailer level with lower prices and then published by Statistics Department as retailer prices.

Comparing the five selected crops cucumber has the highest farm gate price

with 1.13 NIS /kg and eggplant has the lowest with 0.97 NIS/kg.

The producer price in the wholesale market is also the highest for cucumber with 1.72NIS/kg and the lowest is for potatoes with 1.19NIS/kg.

The average percent shares of the producer to the wholesale prices is about 81.5% .

For next studies there must be more clarification of how the retailer price are gathered so we can be sure that the share of farmers is right calculated.

The damages of the products and the losses could be the main factor of market inefficiency as a result of the closures and the inability of exporting the product.

### **Results and analysis of the different crops and regions**

Annexes 1-4 show the farm gate price, producer price at wholesale markets, wholesaler prices, and retailer prices for these selected crops in the West Bank and Gaza. They show also the different percent shares for the different participants in the marketing process.

The results for the share of farmers in the West Bank compared to the previous study show that the margins of the fruits are less for the present study; producer share in the previous, for grapes and plums is about 0.63 compared to 0.50 in this study. For vegetables, the two studies almost show the same results with a slight decrease in the present study.

The results showed that the farmers' shares are low although it has been noticed that too much costs are being



paid by them for the marketing process. This means that it is important to address these costs and to decrease them where appropriate as well as fostering the efficiency of the market.

When we compare the average prices of fruits and vegetables of the West Bank and Gaza, we find that the consumer prices are less in Gaza for all of the selected products.

The marketing margins of the producers are also higher for Gaza. It is interesting to see crops like tomato and cucumbers have a percent share of producer consumer price that equals 1.12, 1.05. Most of the quantities of these crops are registered by the departments of agriculture as sold crops outside Gaza, either to Israel or to the West Bank. Even if these crops have not passed by borders to Israel and West Bank, they returned to Gaza, they are not registered again,

and they may be destroyed or sold with very low prices and this results in low consumer price.

## Marketing activities and costs

### Wholesalers

Marketing costs for fruit and vegetable crops until reaching wholesale markets in West Bank included packaging, transportation, commission fees, and storage costs for potatoes and onions.

The average of marketing costs of fruits and vegetable crops until reaching wholesale markets in West Bank for the period of 2005 are summarized in Table

1. These were calculated depending on field estimations of meeting with traders and farmers on 2005.

**Table 1: Marketing costs for fruit and vegetable crops until reaching wholesale markets in the West Bank**

Item	Costs
Packaging	120 NIS / ton
Transportation	160 NIS/ton
Fees	8% of the wholesaler price
Losses	10% of the wholesaler price
Storing for bananas and onions	50 NIS / ton
Packaging for potatoes and onions	20 NIS / ton

Source: Estimations of the author depending on meeting with traders and farmers

The total marketing costs for the selected crops are summarized in Table 2. Table 2 shows that the marketing costs are in general higher for fruit crops than vegetable crops. Plums followed by grapes are having the highest market-

ing costs while potatoes have the least marketing costs, the reason for this is that the packaging material which are used for potatoes are costing less than the other crops.



**Table 2: Total marketing costs for selected fruit and vegetable crops for different regions in the West Bank and Gaza until reaching wholesale markets in NIS/ ton**

Crop	Marketing costs in NIS/ton
Oranges	520
Lemons	585
Bananas	660
Grapes	715
Plums	820
Tomatoes	565
Dry onions	500
Cucumbers	600
Egg plants	560
Potato	440

Source: Average producer prices published by the Palestinian Bureau of Statistics, and author's estimations depending on field survey data 2005.

## Retailers

Retailer activities range from the activities of the village women who sell on the street or on the margin of the market, to those of the petty - trader with a road side stall, to the activities of the small truck owner who sells to door, and finally, the corner shops, supermarkets, hotels, and restaurants. The costs for these activities are mostly dealing with the management of the retailer to handle these crops to the consumer.

These costs are 15-20% of the retailer prices. Other costs like transportation or fees are mostly neglected, while the distance between the locations of the crop to retailer places is not far, or in general, retailers do not pay fees concerning their sales from fruits and vegetables, the cost of transportation paid

by retailers is less than 5% of retailer price.

Retailers consider the losses that may occur because of the delay of selling as the most important item even though they consider these costs when setting consumer price. Some of them have refrigerators specially the supermarkets have and developed groceries. Others usually try to buy according to the demand of their buyers; the losses may reach 25% of crops.

A new developed activity is rising that deals with packaging and preparing the fresh food for direct consumption and cooking specially for some vegetables. This increases the price and adds a value by the retailer to the commodity; the costs for these are about 5% of retailer price.

**Table 3: Estimation percents of marketing costs for fruit and vegetable crops in retailer markets in the West Bank and Gaza**

Item	Costs
Management and operational cost	15 - 20% of retailer price
Losses	25% of the retailer price
Transportation	2- 5 % of the retailer price
Storing, Packaging, and other marketing services	5% of retailer price

Source: Estimations of the author depending on meeting with retailers

## Conclusions

As it was clarified, the marketing system is said to be efficient if market margins can be reduced by a level of cost, which is less, or equal to the level of expenses involved in providing an additional and good marketing service.

Depending on discussion with farmers, traders, and consumers there is an agreement that the services for marketing the agricultural products are not appropriate, do not give the products the good utilities especially for the form, shape, time and, to some extent, the place utility, which the marketing functions usually give.

When we discuss also the previous tables concerning the marketing costs and margin we see that high costs are paid by farmers for both the transportation and packaging. These high costs could be reduced if farmers organize these two functions in better ways either by being involved more in cooperative or new collectives marketing methods.

Market operations in wholesale and retail markets have been noticed to be too low compared to the high fees, costs, and revenues received by the wholesal-

ers and retailers. There is an absence of product differentiations. The undeveloped infrastructures of the markets and the limited handling process are referred to the little investment traders at all levels undertake. These operations need to be developed in a way to maintain the quality of the agricultural products.

The losses are major item of the marketing costs for all the market chain. This item should be reduced in order to improve the absolute shares of parties in the marketing process. Losses could be reduced by improving the facilities and techniques of post harvest and marketing.

## Recommendations

- Finding ways for increasing the shares of farmers like cooperatives and methods of marketing in collective ways.
- Reducing the transportation and packaging costs by improving the farmers' techniques in doing these two functions.
- Improving the market operations in wholesale and retail markets to cover the high fees, costs, and revenues re-

ceived by the wholesalers and retailers so farmers get more benefits.

- Maintaining the quality of products and receiving better prices, traders should invest more in the developing of the market infrastructure.

- Reducing the products' losses by improving the facilities and techniques of post harvest and marketing to improve the marketing operation efficiency.

- Conducting more research on the different market parties and channels to check their problems and how to solve them.

- The Bureau of Statistics and the Ministry of Agriculture in Palestine need to develop the agricultural marketing information system to be more reliable and accurate.

### Annex 1: The average estimates of marketing margins in the West Bank for selected fruit and citrus

Item	Orange	Lemon	Banana	Grapes	Plums
Farm gate price in NIS / kilo	0.96	1.12	1.18	1.70	2.20
Producer price in wholesale market in NIS / kilo	1.24	1.40	1.46	1.98	2.48
Percent share of farm gate price to producer price in wholesale market	0.77	0.80	0.81	0.86	0.89
Wholesaler price in NIS / kilo	1.51	1.71	1.84	2.42	3.02
Percent share of farm gate price to wholesale price	0.63	0.66	0.64	0.70	0.73
Percent share of producer to wholesale price	0.82	0.82	0.79	0.82	0.82
Absolute share of wholesaler in NIS / kilo	0.27	0.31	0.38	0.44	0.54
Percent share of wholesaler to wholesale price	0.18	0.18	0.21	0.18	0.18
Retailer price in NIS / kilo	2.52	2.71	3.41	3.88	4.76
Absolute share of retailer in NIS / kilo	1.01	1.00	1.57	1.46	1.74
Percent share of farm gate price to retailer price	0.38	0.41	0.35	0.44	0.46
Percent share of producer to retailer price	0.49	0.52	0.43	0.51	0.52
Percent share of wholesaler to retailer price	0.11	0.11	0.11	0.11	0.11

Percent share of retailer to re- tailer price	0.40	0.37	0.46	0.38	0.37
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Source: Author's estimations depending on average producer prices published by the Palestinian Bureau of Statistics.

## Annex 2: The average estimates of marketing margins in the West Bank for selected vegetables

Item	Tomato	Dry onion	Cucumber	Egg-plant	Potato
Farm gate price in NIS / kilo	1.02	1.01	1.24	0.97	1.01
Producer price in whole-sale market in NIS / kilo	1.30	1.19	1.52	1.25	1.19
Percent share of farm gate price to producer price in wholesale market	0.78	0.85	0.82	0.78	0.85
Wholesaler price in NIS / kilo	1.58	1.51	1.85	1.53	1.45
Percent share of farm gate price to wholesale price	0.64	0.67	0.67	0.64	0.70
Percent share of producer to wholesale price	0.82	0.79	0.82	0.82	0.82
Absolute share of wholesaler in NIS / kilo	0.28	0.32	0.33	0.28	0.26
Percent share of wholesaler to wholesale price	0.18	0.21	0.18	0.18	0.18
Retailer price in NIS / kilo	2.34	2.3	2.59	2.34	2.42
Percent share of farm gate price to retailer price	0.43	0.44	0.48	0.42	0.42
Percent share of producer to retailer price	0.55	0.52	0.59	0.54	0.49
Percent share of wholesaler to retailer price	0.12	0.14	0.13	0.12	0.11
Percent share of retailer to retailer price	0.32	0.34	0.29	0.35	0.40

Source: Author estimations depending and average producer prices published by the Palestinian Bureau of Statistics.

### Annex 3: The average estimates of marketing margins in the Gaza Strip for selected fruit crops

Item	Orange	Lemon	Grapes
Farm gate price in NIS / kilo	0.67	1.07	1.68
Producer price in wholesale market in NIS / kilo	0.95	1.35	1.96
Percent share of farm gate price to producer price in wholesale market	0.71	0.79	0.86
Wholesaler price in NIS / kilo	1.16	1.65	2.39
Percent share of farm gate price to wholesale price	0.58	0.65	0.70
Percent share of producer to wholesale price	0.82	0.82	0.82
Absolute share of wholesaler in NIS / kilo	0.21	0.30	0.43
Percent share of wholesaler to wholesale price	0.18	0.18	0.18
Retailer price in NIS / kilo	1.79	2.37	3.26
Percent share of farm gate price to retailer price	0.37	0.45	0.52
Percent share of producer to retailer price	0.53	0.57	0.60
Percent share of wholesaler to retailer price	0.12	0.13	0.13
Percent share of retailer to retailer price	0.35	0.30	0.27

Source: Author estimations depending and average producer prices published by the Palestinian Bureau of Statistics

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